

How To Use the WWW To Distribute STI

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This presentation explains how to use the World Wide Web (WWW) to distribute your scientific and technical information (STI) as hypermedia. WWW clients and servers use the HyperText Transfer Protocol (HTTP) to transfer hypermedia documents, that is, documents containing links to other text, graphics, video, and sound. The standard language for these documents is the HyperText MarkUp Language (HTML). HTML documents are simply text files with formatting codes that contain layout information and hyperlinks. To make your scientific and technical information available to the WWW as hypermedia documents, you must learn how to create HTML documents and make them available on an HTTP server. You can create HTML documents with any text editor or with one of the publicly available HTML editors or converters. You can also use HTML to include links to image formats such as XBM, GIF, TIFF, JPEG, MPEG. Most of the information that you need to get started is available on the Internet. This presentation is available on-line. The URL is <http://sti.larc.nasa.gov/demos/workshop/introtext.html>

Using the WWW for STI Allows Users To

- Refer back to equations, figures, and text in previous sections
- Access references that are available on-line
- Attach personal, group, or public annotations to documents
- Download figures for manipulation or inclusion in other reports
- Download computer codes, programs, and documentation
- Access simulation models, data files, and videos
- Browse files in HDF (Hierarchical Data Format), a machine-independent file format that allows arbitrary grouping and annotation of heterogeneous data elements.
- Send scientific data in a hypermedia document across the network for graphical and statistical inspection and analysis on programs such as
 - Collage, NCSA's synchronous collaboration tool for scientific data analysis and manipulation.
 - Polyview, NCSA's collaborative tool for three-dimensional geometric and polygonal data analysis.
 - Data Management Facility (DMF), NCSA's scientific data management and archival system.

Distributing STI on the WWW as Hypermedia

- Learn How To Create HTML Documents
- Make Documents Available on an HTTP Server

Hypermedia Documents Contain Links To

- **Text**
(7-bit ASCII)
- **Graphics**
(e.g., Graphs, Photos, Line Drawings)
- **Video**
(e.g., Crack Propagation or Air Flow Over Wing Configuration)
- **Sound**
(e.g., Engine Noise, Narration)

HyperText Transfer Protocol (HTTP)

HTTP is a stateless search, retrieval, and manipulation protocol with the speed necessary for a distributed hypermedia information system.

These HTTP Servers Are Available on the Internet

- NCSA httpd
- BSDI Plexus
- GN (a gopher/http server from NWU)
- CERN HTTP server
- MacHTTP - a Macintosh HTTP server
- serweb - Windows 3.1/NT HTTP server (requires winsock)
- HTTPS - Windows NT HTTP server (for PCs and Alphas)
- NCSA httpd for Windows

Your system administrator should be able to help you set up the http server. If not, contact m.l.nelson@larc.nasa.gov about serving files from www.larc.nasa.gov

HyperText MarkUp Language (HTML)

HTML documents are 7-bit ASCII files with formatting codes that contain layout information and hyperlinks to text, graphics, video, and sound.

How To Create HTML Documents

- Create HTML Documents With any Text or HTML Editor
 - Create HTML Documents With a Word Processor and Export as ASCII
 - Create Documents With a Word Processor and Convert to HTML
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Sample HTML Document

HTML References

- A Beginner's Guide to HTML
 - Crash Course on Writing Documents for the Web
 - Elements of HTML Style
 - HTML Tutorial
-

Tips For Writing HTML

- Save As HTML Option
- Open Local Option

Sample HTML Document

```
<h1> Heading Level One </h1>
```

This text is a sample paragraph. Paragraphs must be separated with the html paragraph tag because

blank lines and tabs are ignored.

```
<p>
```

This text is another sample paragraph. You can use html tags to display *<i> italic text</i>*

```
<h2> Heading Level Two </h2>
```

This text contains an unordered list.

```
<ul>
```

```
<li> Item 1
```

```
<li> Item 2
```

```
</ul>
```

Heading Level One

This text is a sample paragraph. Paragraphs must be separated with the html paragraph tag because blank lines and tabs are ignored.

This text is another sample paragraph. You can use html tags to display *italic text* and **bold text**.

Heading Level Two

This text contains an unordered list.

- Item 1

- Item 2

HTML Link To Another Document

You can link regions of text or images to another document or image as well as to a specific section in a document. Here is a hypertext link (*called an anchor*) to the next document.

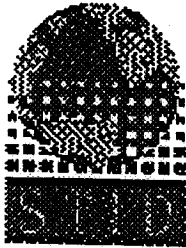
Here is the HTML tag:

```
<a href="image.html"> next document </a>
```

Mosaic Can Display Inline Images in Two Formats

- XBM (X Bitmap)
- GIF (Graphic Image Format)

For example, here is the logo for our division



Here is the HTML tag:

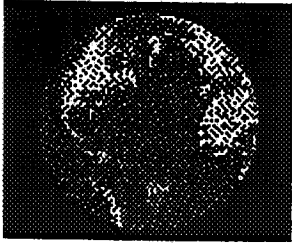
```

```

Mosaic Can Open External Images in These Formats

- XBM (X Bitmap)
- GIF (Graphic Image Format)
- HDF (Hierarchical Data Format)
- PS (PostScript Format)
- TIFF (Tagged Image File Format)
- JPEG (Joint Photographics Expert Group)
- MPEG (Motion Pictures Expert Group)
- Any Format For Which You Have a Viewer

Here is an inlined image (thumbnail) with a hypertext link to a higher resolution photo in JPEG format.



Here is the HTML tag:

```
<a href="http://sti.larc.nasa.gov/photos/photo2.jpg">
```

```
 </a>
```

Displaying Scientific Equations

Display Scientific Equations As Inline Images

Here is an example of an equation in XBM format:

$$\beta = \tan^{-1} \left(\frac{M_{2n}}{M_{2p}} \right) = \tan^{-1} \left(\frac{M_{2n}}{(T_1/T_2)^{1/2} M_1 \sin A} \right) \quad (14 K)$$

Here is an example of the same equation in GIF format:

$$\beta = \tan^{-1} \left(\frac{M_{2n}}{M_{2p}} \right) = \tan^{-1} \left(\frac{M_{2n}}{(T_1/T_2)^{1/2} M_1 \sin A} \right) \quad (5 K)$$

A separate HTTP connection must be made to retrieve each inline image, which is stored in a separate file. Thus, documents with multiple images take longer to download and require more storage for the document elements.

Sample Documents With 21 Equations

- Equations converted to X Bitmaps: 229 KB total: 16 seconds
- Equations converted to GIFs: 13.8 KB total: 11 seconds

(Source: "Thoughts On Scientific HTML Documents" by M.C. Grant from Stanford University.)

Problems With Displaying Scientific Information

- HTML Does Not Support Greek & Mathematical Symbols.
- Equations Are Stored in Multiple Files.
- Some HTML Converters Ignore Equations.
- Equations Are Difficult To Align With Text.
- Equations Are Not Scaled To Match Text.

- Superscripts & Subscripts Are Not Supported.
- Tables Are Difficult To Format.

The next version of HTML (*called HTML+*) will address some of these issues.

Sample Table

Table 6. Parallel Golden Block Method

No of Proc.	No. of Points	Time (sec)	Speedup for	
			PGB	GS
1	2	0.355	1.00	1.00
1	12	0.540	1.00	0.66
2	12	0.277	1.95	1.28
3	12	0.187	2.89	1.90
4	12	0.144	3.76	2.47

SESSION 7 Graphics and Image Processing

Chaired by

David C. Banks

- 7.1 Image Tools for UNIX - David Banks
- 7.2 From Computer Images To Video Presentation: Enhancing Technology Transfer - Sheri Beam
- 7.3 Data Visualization and Animation Lab (DVAL) Overview - Bill Von Ofenheim , Kathy Stacy
- 7.4 Data Visualization and Animation Lab Applications - Kurt Severance and Mike Weisenborn